Florida Department of Transportation

RON DESANTIS
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

JARED W. PERDUE, P.E.
SECRETARY

September 17, 2026

Daniel Holt, PE, PTOE
Director, Project Delivery
Director, Technical Services
FHWA
400 West Washington Street, Suite 4200
Orlando, FL 32801

Re: State Specifications Office
Section: 346
Proposed Specification: **3460302 Structural Portland Cement Concrete**
Associated Specification: **1050404MM92V2 Contractor Quality Control General Requirements**

Dear Mr. Holt:

We are submitting, for your approval, two copies of the above referenced Supplemental Specification.

The changes are proposed by Mateo Carvajal to update language related to concrete class substitutions, chloride contents, definition of delivery and placement times, and independent verification sample frequency.

Please review and transmit your comments, if any, within two weeks (10 business days). Comments should be sent via email daniel.strickland@dot.state.fl.us.

If you have any questions relating to this specification change, please call me at (850) 414-4130.

Sincerely,

Signature on File

Daniel Strickland, P.E.
State Specifications Engineer

DS/am
Attachment
cc: Florida Transportation Builders' Assoc.
State Construction Engineer

STRUCTURAL PORTLAND CEMENT CONCRETE
(REV 6-15-26)

SUBARTICLE 346-3.2 is deleted and the following substituted:

346-3.2 Concrete Class Substitutions: The Engineer may allow the substitution of a higher class concrete in lieu of the specified class concrete when the substituted concrete mixes are included as part of the QC Plan, or for precast concrete, the Precast Concrete Producer QC Plan. The substituted higher class concrete must ~~meet or exceed~~comply with all the requirements of the specified class concrete, including any paste volume and drying shrinkage requirements applicable to the specified class. The Engineer may waive the paste volume and drying shrinkage requirements for the substituted mix when project-specific conditions such as the need for accelerated strength gain justify the use of a higher class mix.

When the average compressive strength is less than the specified minimum compressive strength of the higher class mix design, notify the Engineer. Acceptance is based on the requirements in Table 346-3 for the specified class concrete.

Table 346-3
Compressive Strength, w/cm, and Slump of Concrete Classes

Class of Concrete	28-day Specified Minimum Compressive Strength (f'c) (psi)	Maximum Water to Cementitious Materials Ratio (pounds per pounds)	Target Slump Value (inches)
I (Seal)	3,000	0.53	8
I (Pavement) (1) (5)	3,000	0.50	1.5 or 3
II (3)	3,400	0.53	3 (2)
II (Bridge Deck)	4,500	0.44	3 (2)
III	5,000	0.44	3 (2)
IV	5,500	0.41 (4)	3 (2)
IV (Drilled Shaft)	4,000	0.41	8.5
V	6,500	0.37 (4)	3 (2)
VI	8,500	0.37 (4)	3 (2)
VII	10,000	0.37 (4)	3 (2)

Notes:
(1) Meet the requirements of Section 350.
(2) For increased slump concrete, flowing concrete, SCC and slip form concrete meet the requirements of 346-3.1.
(3) For precast three-sided culverts, box culverts, endwalls, inlets, manholes and junction boxes, the target slump value and air content will not apply. The maximum allowable slump is 6 inches, except as noted in (2). The Contractor is permitted to use concrete meeting the requirements of ASTM C478 (4,000 psi) in lieu of the specified Class II concrete for precast endwalls, inlets, manholes and junction boxes.
(4) When silica fume or metakaolin is required, the maximum water to cementitious material ratio will be 0.35. When ultrafine fly ash is used, the maximum water to cementitious material ratio will be 0.30.
(5) If 28-day strength is 2,500 or greater, concrete may be accepted if 28-day compressive strength is reached by 56 days.

SUBARTICLE 346-3.3.2 is deleted and the following substituted:

346-3.3.2 Chloride Content Limits: Use the following maximum allowable chloride content limits for the concrete application and/or exposure environment shown:

Table 346-5 Total Chloride Content Limits for Concrete Construction		
Application/Exposure Environment		~~Maximum Allowable~~Total Chloride Content, (~~pounds per cubic yard of concrete~~lbs/yd^3)
Non-Reinforced Concrete or Using Non-Corrosive Reinforcement(1)		Not Specified ~~Test Needed~~
Reinforced Concrete	Slightly Aggressive Environment	≤ 0.70
	Moderately ~~or Extremely~~ Aggressive Environment	≤ 0.450
	Extremely Aggressive Environment	≤ 0.40
Prestressed Concrete		0.40
Notes: (1) Stainless steel, Stainless steel-clad or Fiber Reinforced Polymer Reinforcement		

~~Suspend concrete placement immediately for every mix design if chloride test results exceed the limits of Table 346-5 until corrective measures are made.~~ Submit an Engineering Analysis Scope in accordance with 6-4 when chloride test results exceeded the limits in Table 346-5. ~~by a~~The Specialty Engineer responsible for the analysis must be knowledgeable in the areas of corrosion and corrosion control~~,~~. ~~to~~The evaluation shall determine ~~if~~whether the material meets the intended service life of the structure ~~on~~for all concrete produced from the mix design, covering the period from the failing chloride test results back to the ~~previous~~most recent passing test results.

SUBARTICLE 346-4.1 is deleted and the following substituted:

346-4.1 Drilled Shaft Concrete: Notify the Engineer at least 48 hours before placing drilled shaft concrete. Obtain the slump loss time from the slump loss test results demonstrating that the drilled shaft concrete maintains a slump of at least 5 inches throughout the concrete elapsed time before drilled shaft concrete operations begin.

Perform the slump loss test at the anticipated ambient temperature for drilled shaft placements greater than 30 cubic yards and an elapsed time of greater than five hours.

Obtain slump loss test results from an approved laboratory or from a field demonstration. Slump loss test results for drilled shafts requiring 30 cubic yards of concrete or less and a maximum elapsed time of five hours or less may be done in a laboratory. Obtain all other slump loss test results in the field.

The concrete elapsed time is defined in Section 455. Obtain the Engineer's approval for use of slump loss test results including elapsed time before concrete placement begins.

Test each load of concrete for slump to ensure that it is within the limits of this Section. Initially cure acceptance cylinders for 48 hours before transporting them to the laboratory.

For Drilled Shaft concrete, the transit and placement times may be extended, provided the elapsed time does not exceed the slump loss time established for the approved mix design and the concrete exhibits the required target slump per Table 346-3 immediately prior to placement.

If the elapsed time during placement exceeds the slump loss test data, submit an Engineering Analysis Scope in accordance with 6-4 by a Specialty Engineer knowledgeable in concrete foundations, to determine if the shaft is structurally sound and free from voids. At the direction of the Engineer, excavate the drilled shaft for inspection. Obtain approval from the Engineer before placing any additional shafts.

SUBARTICLE 346-4.3 is deleted and the following substituted:

346-4.3 Flowing Concrete and Self-Consolidating Concrete (SCC): Use Flowing concrete or SCC when shown in the Contract Documents or to facilitate concrete placement in structures of complex geometric shape or highly reinforcement.

Perform a field demonstration mockup using an approved mix design. Submit the mockup design to the Engineer for approval including the location of the sawcut.

~~Cast~~ Upon approval, construct a partial or full-scale mockup~~(s)~~ and demonstrate ~~through the successful production the ability to produce and place flowing concrete or SCC~~compliance with the specified production and placement requirements.

The design, production, and evaluation product must meet the following requirements:

1. Use the proposed mix design(s).
2. Produce the mockup(s) at the jobsite, using the intended placement and curing methods, such as the use of ready-mix trucks, pumps, chutes, hopper, consolidation equipment, etc. The mockup shall contain reinforcing steel, mass concrete cooling pipes if required during construction, and other embedded items typical of the cast element.
3. Meet the requirements of the plastic properties including the cutoff time.
4. Meet the hardened properties and durability requirement when specified in the Contract Documents.
5. Concrete will be produced in the proposed concrete plant(s).
6. Concrete plant(s) representative(s) must be present during mockup demonstration.
7. Notify the Engineer at least 7 days prior to mockup production.
8. If the production of the structural element that will be represented in the mockup requires concrete from multiple concrete plants, the concrete from each plant must be represented in the mockup.
9. Sawcut the mockup's entire cross-section. Inspect and report for voids, honeycombing, and rock pockets, mix segregation, and other inclusions developed during placement of the concrete.
10. Determine the Coarse Aggregate Index of concrete in accordance with FM 5-617.

11. Complete the demonstration of a successful mockup prior to the beginning of concrete placement operations.

Based on the inspection results of the field demonstration mockup, the acceptance of using flowing concrete or SCC in the structural element or section of the element is at the Engineer's discretion.

The required mockup demonstration may be omitted at the Contractor's request. Submit documentation indicating successful experience of furnishing and placing flowing concrete or SCC on similar Department projects. Such documentation must list projects by date of completion, name or project reference number, structural elements or type of unit placed, quantity of concrete furnished, names and experience of personnel, and contact information for verification.

SUBARTICLE 346-7.2.1 is deleted and the following substituted:

346-7.2.1 ~~Transit~~Delivery Time: Ensure compliance with Table 346-8 ~~between the initial introduction of water into the mix and completely discharging all the concrete from the truck~~ for the maximum delivery time, measured from the initial introduction of water to the mix until complete discharge. Delivery time does not include placement or finishing operations. Reject concrete exceeding the maximum ~~transit~~delivery time, unless otherwise permitted by the Engineer. The Engineer may approve an extension of the ~~transit~~delivery time which will be identified ~~on the approved~~based on the results of mix design trial batch.

Table 346-8	
Maximum ~~Allowable Transit~~Delivery Time(2)	
Non-Agitator Trucks	Agitator Trucks
45 minutes	60 minutes
75 minutes (1)	90 minutes (1)

Note:
(1) ~~(1)~~ When a water-reducing and retarding admixture (Type D, Type G, or Type II) is used.
(2) For drilled shafts maximum delivery time refer to 346-4.1

SUBARTICLE 346-7.2.2 is deleted and the following substituted:

346-7.2.2 Placement Time: All the concrete in a load must be in its final placement position a maximum of 15 minutes after the ~~transit~~delivery time ~~or cutoff time~~ has expired, unless a time extension is approved by the Engineer. ~~As an exception, the Engineer may accept concrete that exceeds the transit time or cutoff time if the load passes the slump or slump flow tests.~~ Place concrete in continuous manner in accordance with Section 400. For drilled shafts maximum placement time, refer to 346-4.1

~~For Class IV (Drilled Shaft) mixes, placement time may be extended provided the slump loss time of the first concrete placed is not exceeded throughout the elapsed time.~~

The Engineer may perform Independent Verification (IV) testing to verify the plastic and hardened properties of the concrete when a time extension is granted.

SUBARTICLE 346-9.1.2 is deleted and the following substituted:

346-9.1.2 Sampling Frequency: At a minimum, the Engineer will sample and test concrete of each mix design for water to cementitious materials ratio, air content, temperature, slump, and compressive strength once per LOT as defined by Table 346-9. The Department ~~will~~may perform Independent Verification (IV) testing to verify compliance with specification requirements~~, at a minimum of once per 6 months~~.

Table 346-9
Sampling Frequency

Class Concrete (1)	LOT Size
I (Seal)	Each seal placement
I (Pavement)	According to Section 350
II, II (Bridge Deck), III, IV, V, VI, VII	50 cubic yards, or one day's production, whichever is less
IV (Drilled Shaft)	50 cubic yards, or one day's production, whichever is less (2)

(1) For any class of concrete used for roadway concrete barrier, the lot size is defined as 100 cubic yards, or one day's production, whichever is less.
(2) Start a new LOT when there is a gap of more than two hours between the end of one drilled shaft placement and the beginning of the next drilled shaft placement.

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Notes:
(1) Meet the requirements of Section 350.
(2) For increased slump concrete, flowing concrete, SCC and slip form concrete meet the requirements of 346-3.1.
(3) For precast three-sided culverts, box culverts, endwalls, inlets, manholes and junction boxes, the target slump value and air content will not apply. The maximum allowable slump is 6 inches, except as noted in (2). The Contractor is permitted to use concrete meeting the requirements of ASTM C478 (4,000 psi) in lieu of the specified Class II concrete for precast endwalls, inlets, manholes and junction boxes.
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Notes: ~~(1)~~(2) Stainless steel, Stainless steel-clad or Fiber Reinforced Polymer Reinforcement		

Submit an Engineering Analysis Scope in accordance with 6-4 when chloride test results exceeded the limits in Table 346-5. The Specialty Engineer responsible for the analysis must be knowledgeable in the areas of corrosion and corrosion control. The evaluation shall determine whether the material meets the intended service life of the structure for all concrete produced from the mix design, covering the period from the failing chloride test results back to the most recent passing test results.

SUBARTICLE 346-4.1 is deleted and the following substituted:

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Perform the slump loss test at the anticipated ambient temperature for drilled shaft placements greater than 30 cubic yards and an elapsed time of greater than five hours.

Obtain slump loss test results from an approved laboratory or from a field demonstration. Slump loss test results for drilled shafts requiring 30 cubic yards of concrete or less and a maximum elapsed time of five hours or less may be done in a laboratory. Obtain all other slump loss test results in the field.

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design and the concrete exhibits the required target slump per Table 346-3 immediately prior to placement.

If the elapsed time during placement exceeds the slump loss test data, submit an Engineering Analysis Scope in accordance with 6-4 by a Specialty Engineer knowledgeable in concrete foundations, to determine if the shaft is structurally sound and free from voids. At the direction of the Engineer, excavate the drilled shaft for inspection. Obtain approval from the Engineer before placing any additional shafts.

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The design, production, and evaluation product must meet the following requirements:

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3. Meet the requirements of the plastic properties including the cutoff time.
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SUBARTICLE 346-7.2.1 is deleted and the following substituted:

346-7.2.1 Delivery Time: Ensure compliance with Table 346-8 for the maximum delivery time, measured from the initial introduction of water to the mix until complete discharge. Delivery time does not include placement or finishing operations. Reject concrete exceeding the maximum delivery time, unless otherwise permitted by the Engineer. The Engineer may approve an extension of the delivery time which will be identified based on the results of mix design trial batch.

Table 346-8	
Maximum Delivery Time[2]	
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The Engineer may perform Independent Verification (IV) testing to verify the plastic and hardened properties of the concrete when a time extension is granted.

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(1) For any class of concrete used for roadway concrete barrier, the lot size is defined as 100 cubic yards, or one day's production, whichever is less.
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